

**Original article:**

## **Histopathological spectrum of appendicectomy specimens in a tertiary care hospital in North India**

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### **ABSTRACT**

**INTRODUCTION:** Appendix is a blind ended, finger like tube that arises from the medial wall of the caecum. It averages 9cms in length and 7 to 8 mm in diameter; located in the right hypochondrium about 2 cm beneath the ileocecal valve. Acute appendicitis is the most common condition that demands immediate surgical management. Appendicectomy specimens removed from patients with acute appendicitis may appear normal macroscopically but histopathological analysis of these cases reveal a baleful lesion. Therefore, histopathology is the gold standard for the diagnosis of these appendicectomy specimens.

**AIM:** To study the histopathological spectrum of all the patients who underwent appendicectomy in our hospital for a period of twelve months from 1st January 2018 to 31<sup>st</sup> december 2018.

**MATERIAL AND METHODS:** This was a prospective study of one year; from 1<sup>st</sup> January 2018 to 31<sup>st</sup> December 2018; in the Post Graduate Department Of Pathology Government Medical College Jammu. Hematoxylin and Eosin (H&E) stained sections were examined microscopically.

**RESULTS:** A total of 500 appendicectomy specimens were received during this period. The age range of patients were 7 to 60 years with a mean age of 35 years. There were 310 males and 190 females with a male to female ratio of 1.63:1. The histopathological examination shows Acute Appendicitis in 295 cases (59%), early acute appendicitis in 63 cases (12.6%), Acute appendicitis with periappendicitis in 97 cases (19.4%), Chronic fibrosing appendicitis in 10 cases (2%) and carcinoid tumour in 4 cases (0.8%), acute appendicitis with calcification in one (1) case (0.2%). Negative appendicectomy rate was seen in 30 cases (6%).

**CONCLUSION:** In our study, most of the cases were clinically diagnosed as appendicitis but a few of them were incidentally diagnosed as malignant on histopathology. Therefore histopathology is a gold standard for the final diagnosis of all appendicectomy specimens.

**KEYWORDS:** Acute appendicitis, appendicectomy, carcinoid.

### **INTRODUCTION:**

Acute appendicitis is predominantly a disease of western world; particularly in Great Britain and United States of America. Its incidence is increasing in India and other developing countries, mainly in urban cities due to increased intake of western diet rich in protein and lower cellulose intake (1). Appendicitis accounts for most common abdominal emergency and appendicectomy is a routinely performed surgery all over the world (2). Approximately

7% of all individuals in the western world suffer from acute appendicitis in their life time; requiring immediate surgical management.

Various etiologies have been identified for acute appendicitis, but luminal obstruction is considered the most critical factor, as it triggers the inflammatory process. Although lymphoid hyperplasia and fecoliths are the most common causative factors of luminal obstruction, other unusual factors have been associated with the condition, including mucocele (3), enterobiasis, amebiasis, taeniasis (4), endometriosis (5), tuberculosis, actinomycosis, adenovirus, other granulomatous diseases (6), eosinophilic granuloma (7), neurogenic appendicopathy (8), diverticulitis (9), and appendiceal malignancies, such as carcinoid tumor, gastrointestinal stromal tumor, hyperplastic polyp, tubular adenoma, villous adenoma, neurofibroma, mucinous cystadenoma, adenocarcinoma, mucinous cystadenocarcinoma, lymphoma, and leukemia (10). Aberrant findings occur in a small percentage of appendices, but can have major consequences (11).

The usual presentation of Acute Appendicitis is with periumbilical colicky pain and vomiting, with the pain later localized to the right lower abdominal quadrant. These symptoms are associated with fever, leucocytosis, an elevated erythrocyte sedimentation rate and C-reactive protein. It is reported more common in males than females (12, 13). The pre-operative diagnosis of acute appendicitis is based on clinical findings along with blood tests such as WBC count and C-reactive protein. Unenhanced CT is an accurate imaging technique for the initial examination of these patients(14,15), whereas the role of ultrasonography is controversial.

#### **MATERIAL AND METHODS:**

The present study was a prospective study conducted in the post graduate department of pathology, government medical college Jammu from January 2018 to December 2018. A total of 500 appendicectomy cases who came in the histopathology section of the department were studied. The specimens were fixed in 10% buffered formalin. In each case, grossing of the specimens was carried out, sections were taken for histology. Tissue processing was done in an automatic tissue processor, followed by staining of the sections using Haematoxylin and Eosin staining procedure(16).

#### **RESULTS:**

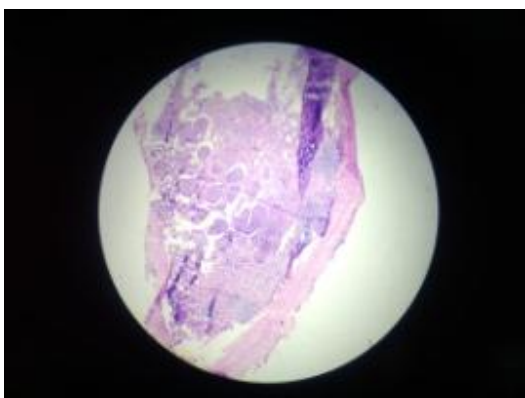
A total of 500 cases were studied including 310 males and 190 females. The youngest patient was 7 years old and the oldest patient was 60 years of age. Overall, a greater number of appendicectomies were performed in males than in females. The most common presenting symptom was pain in the right iliac fossa, followed by generalized abdominal pain, fever, nausea and vomiting. In the present study, the most common clinical diagnosis for which appendicectomy was done was acute appendicitis. Maximum number of patients who underwent appendicectomies were in the age range of 21-30 years. Grossly, mucosal congestion was the most common finding. On histopathological examination, Acute Appendicitis was seen in 295 cases (59%), early acute appendicitis in 63 cases (12.6%), Acute appendicitis with periappendicitis in 97 cases (19.4%), Chronic fibrosing appendicitis in 10 cases (2%), acute appendicitis with calcification in one (1) case (0.2%). There were 4 cases of carcinoid tumour(0.8%) Negative appendicectomy rate was seen in 30 cases (6%).

**Table 1:** Table showing histopathological findings for 500 appendicectomies.

HISTOPATHOLOGICAL DIAGNOSIS	No. of cases	%
Acute appendicitis	295	59%
Early acute appendicitis	63	12.6%
Acute appendicitis with periappendicitis	97	19.4%
Chronic fibrosing appendicitis	10	2%
Acute appendicitis with calcification	1	0.2%
Carcinoid	4	0.8%
Negative appendicectomy	30	6%

**Table 2 :** Age-wise distribution of various lesions seen in appendicectomy specimens.

LESIONS	AGE GROUP ( IN YEARS)			
	0-20	21-40	41-60	61-80
Acute appendicitis	98	140	55	2
Acute appendicitis with periappendicitis	50	34	10	3
Early acute appendicitis	26	34	3	-
Chronic fibrosing appendicitis	3	4	1	2
Acute appendicitis with calcification	-	1	-	-
Carcinoid	2	2	-	-
Normal appendix	12	16	2	-



**Fig. 1** Photomicrograph showing carcinoid appendix( H&E 10X).

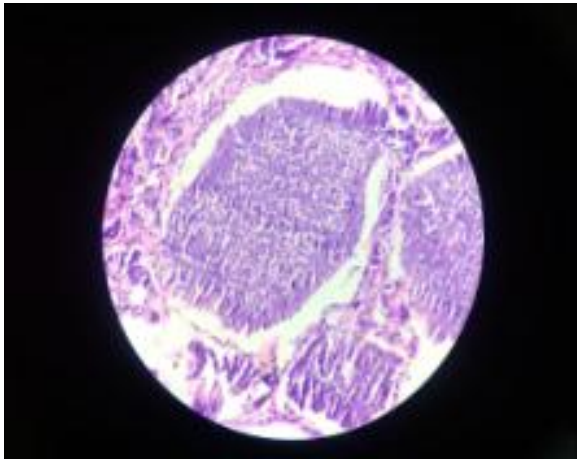


Fig 2 Photomicrograph showing Carcinoid appendix (H&E 40X).

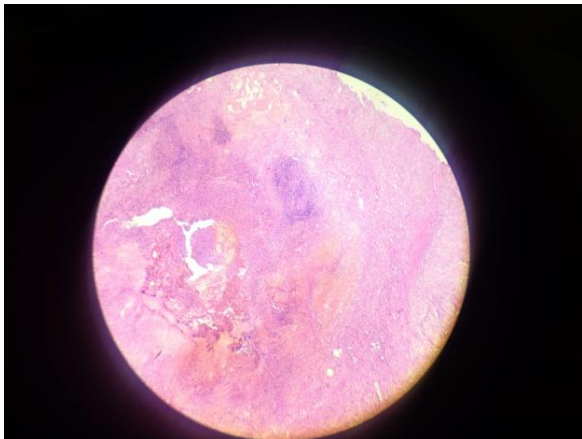


Fig 3. Photomicrograph showing Acute necrotizing appendicitis (H&E 10 X).

#### **DISCUSSION:**

Histopathological examination of appendix is necessary to confirm the diagnosis of acute appendicitis and to reveal additional findings that might not be evident clinically or intra operatively but may change the course of further management of the patient. In the present study , emergency appendicectomy was the preferred approach in maximum number of cases (66%) followed by interval appendicectomy(34%) . Deakin et al(17) and Sharma S et al(18) also reported that emergency appendicectomy was the management of choice in most of the cases. Maximum number of patients who underwent appendicectomy were in the age group of 21-30 years. Marudanayagam et al (2) also reported that most of the appendicectomies (64.58%) were performed in the second decade of life. A greater percentage of appendicectomies were performed in males as compared to females. These findings were in concordance with the studies done by Sharma S et al (18), Nabipour et al (19) and Makaju et al (20). In the present study of 500 cases, 466 were non neoplastic and only 4 were neoplastic. In the study done by Sharma et al(18), they also reported non neoplastic diseases in 98.6% cases. Similarly, a study done by Blair et al (21) also reported non neoplastic diseases in 80% cases. In our study, 30 cases i.e 6% show normal histology. Both non neoplastic and

neoplastic lesions were more common in males. Zulfikar et al (22) studied 323 appendicectomy cases , out of which 196 (60.7%) were males and 127(39.3%) were females. Mucosal congestion was the most common abnormal finding seen grossly (58%) cases, followed by fecolith in the lumen (22% cases). Sharma S et al (18) also reported that mucosal congestion was the commonest finding seen in 46.4% cases. Acute appendicitis constituted the most common histopathological lesion for which appendicectomy was done and was seen in 59% cases. These findings were in concordance with the studies done by Sharma S et al(18), Chang(23), Blair et al(21) and Edino et al(24). In present study, acute appendicitis with periappendicitis was the second most common lesion for which appendicectomy was done which constituted 19.4% cases. Sharma S et al also reported acute appendicitis with peri appendicitis in 29% of the cases. Early acute appendicitis was the third most common lesion seen in 12.6% of the cases which was in concordance with the studies done by Nabipour et al(19) and Sharma S et al (18). Chronic fibrosing appendicitis was seen in 10 cases i.e 2% of the cases. Similar results were also showed in other studies done by Shreshtha R and Zulfikar et al.(22,25). There was one case of acute appendicitis with calcification in the present study. A diagnosis of carcinoid tumour was made in 4 cases. This was in concordance with the studies done by Hof KH et al(26) who found carcinoid in 7 cases i.e 0.47%. In about 30 cases, no significant abnormality was seen histopathologically and these were labeled as normal appendices, thus accounting for negative appendicectomy rate of 6%. Various studies have shown a wide range of negative appendicectomy rate that falls between 6.1 to 34.2% (27,28). Negative appendicectomy rate was higher in females as compared to males. Therefore, in females other causes of abdominal pain should be searched out if appendix appear normal during surgery. In our study, we found other pathologies like twisted ovarian cyst, follicular cyst and Meckel's diverticulitis as the causes of acute abdominal pain in case of negative appendicectomy as also shown in other studies(2). The role of diagnostic laparoscopy followed by appendicectomy if necessary in fertile female patients was found to reduce the rate of negative appendicectomy many folds (29).

#### **CONCLUSION:**

The present study showed that histopathological examination of the appendix yield important clinical information in addition to the operative findings and it should be undertaken in all cases of acute appendicitis. There are a number of unusual diagnoses found in appendicectomy specimens supporting the role of routine histopathology. We concluded that histopathology remains the gold standard for the diagnoses of acute appendicitis.

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